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FIG. 1 (PRIOR ART)

| PICTURE LAYER (110) | SLICE LAYER (120) | MACROBLOCK LAYER (130) | BLOCK LAYER (140) |

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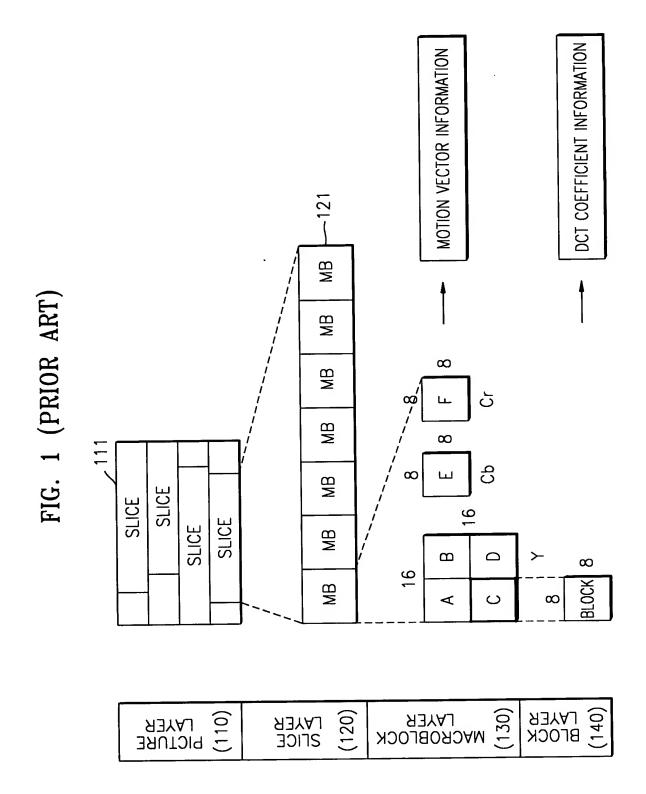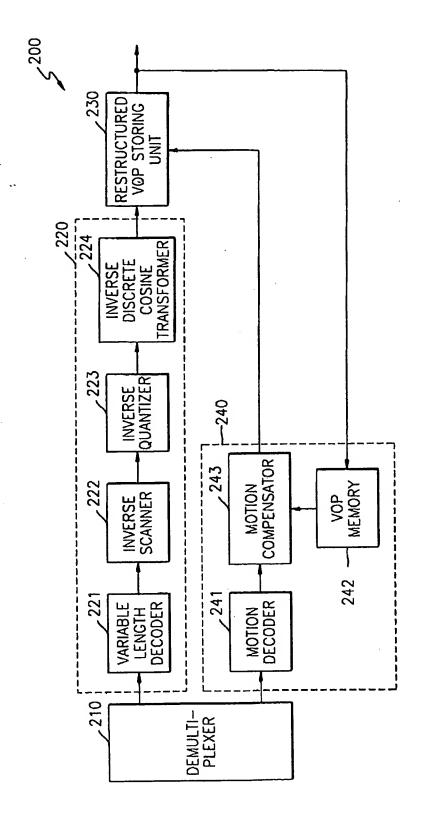Filing Date: August 26, 2003
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FIG. 2 (PRIOR ART)

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FIG. 3 (PRIOR ART)

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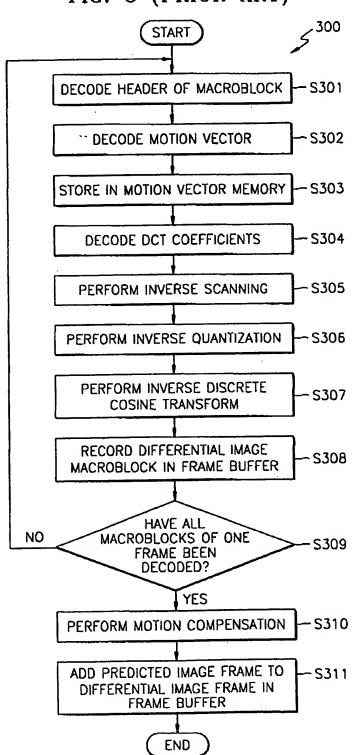Filing Date: August 26, 2003
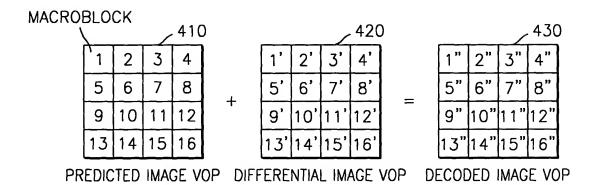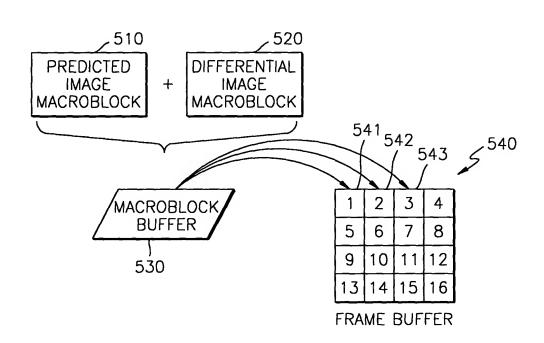Darryl Mexic 202-293-7060
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FIG. 4 (PRIOR ART)

MACROBLOCK

410			
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

+

420			
1'	2'	3'	4'
5'	6'	7'	8'
9'	10'	11'	12'
13'	14'	15'	16'

=

430			
1"	2"	3"	4"
5"	6"	7"	8"
9"	10"	11"	12"
13"	14"	15"	16"

PREDICTED IMAGE VOP   DIFFERENTIAL IMAGE VOP   DECODED IMAGE VOP

FIG. 5

510 PREDICTED IMAGE MACROBLOCK	+	520 DIFFERENTIAL IMAGE MACROBLOCK

MACROBLOCK BUFFER

530

541 542 543   540

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

FRAME BUFFER

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FIG. 6

600

MPEG-4 VIDEO DECODER

610

MACROBLOCK-WISE PROCESSING UNIT

620

PREDICTED IMAGE CALCULATION UNIT

630

DIFFERENTIAL IMAGE CALCULATION UNIT

MPEG VIDEO BITSTREAM

640

MACROBLOCK BUFFER

650

FRAME BUFFER

DECODED VOP

FIG. 7

620

PREDICTED IMAGE CALCULATION UNIT

621

MOTION VECTOR DECODER

622

MOTION VECTOR DETERMINER

623

MOTION COMPENSATOR

MPEG VIDEO BITSTREAM

MACROBLOCK BUFFER

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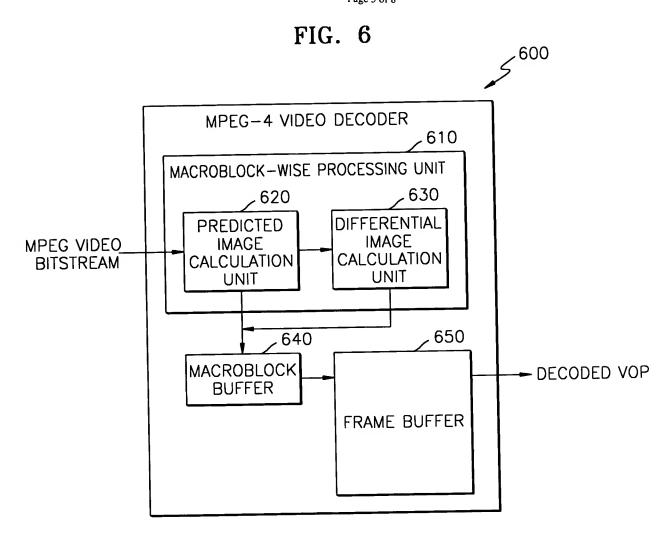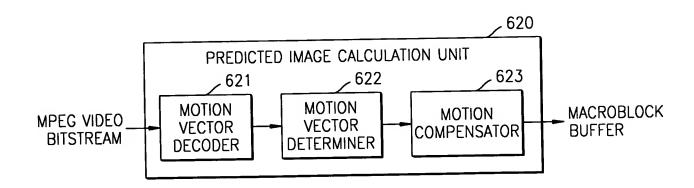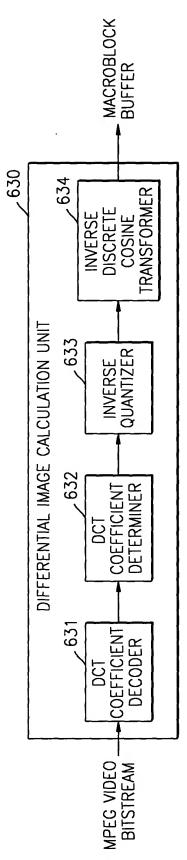Filing Date: August 26, 2003
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FIG. 8

MPEG VIDEO BITSTREAM

DIFFERENTIAL IMAGE CALCULATION UNIT — 630

631 DCT COEFFICIENT DECODER

632 DCT COEFFICIENT DETERMINER

633 INVERSE QUANTIZER
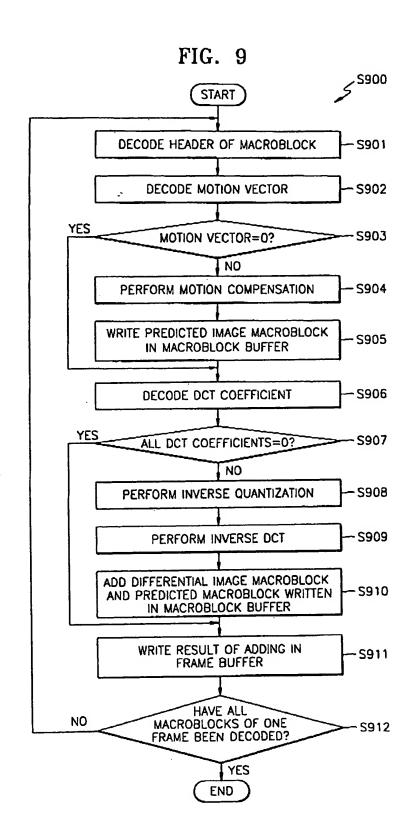
634 INVERSE DISCRETE COSINE TRANSFORMER

MACROBLOCK BUFFER

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FIG. 9

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FIG. 10A

QP	AKIYO 118800blk	FOREMAN 475200blk	MOBILE 475200blk
5	90%	62%	22%
12	97%	89%	48%
20	99%	95%	69%

FIG. 10B

QP	AKIYO 118800blk	FOREMAN 475200blk	MOBILE 475200blk
5	95%	29%	9%
12	96%	47%	10%
20	97%	36%	13%

FIG. 10C

SEQUENCE	QP	SPEED (fps)		RATE
		MS REFERENCE	OPTIMIZED	
AKIYO (qcif)	5	46	111	2.4
	12	52	133	2.56
	20	55	142	2.58
FOREMAN (cif)	5	8	16	2.0
	12	12	29	2.41
	20	13	30	2.30
MOBILE (cif)	5	3	5	1.67
	12	6	11	1.83
	20	8	15	1.89